WEST

Generate Collection

L11: Entry 17 of 73 File: USPT Aug 24, 1999

DOCUMENT-IDENTIFIER: US 5942169 A
TITLE: Optimization of overmolding method for three-dimensional hollow molded article

Brief Summary Text (3):
An over-molding method (also called "two-shells method" or "dual-molding method") is one method of producing a three-dimensional hollow molded article from a thermoplastic resin by an injection molding method. In the over-molding method, a core having a hollow portion is placed or set in a cavity of a mold, and a molten resin is injected into a space formed by the core and a cavity wall of the mold through a resin injection portion (resin gate portion) provided in the mold. In this manner, at least part of the outer surface of the core is covered with the resin to form a three-dimensional hollow molded article. A covering member formed of a resin covering at least part of the outer surface of the core is called a shell.

Brief Summary Text (4):
When the above over-molding method for a three-dimensional hollow molded article is used, there can be produced a three-dimensional hollow molded article having a complicated form and a hollow portion, which so far cannot be produced by a conventional injection molding method. Further, the over-molding method is advantageous in that the number of parts for an end product can be decreased by integrating other parts, that the inner surface of the hollow portion is flat and smooth, that the molded article has excellent dimensional accuracy and that the production facilities are inexpensive. The over-molding method is widely used as a molding method for producing three-dimensional hollow molded articles having complicated forms such as a sphere, a box, a straight tube, a curved tube or a manifold together with a hollow portion in the fields of automobile parts such as an air intake manifold and an air duct, tubings for liquid such as water and other various articles having a hollow portion.

Brief Summary Text (104):
The core of a resin may be produced by any known method, while an injection molding method, an extrusion molding method, a blow molding method and a compression molding method are preferred. The core may be produced not only as a one-piece article but also as one obtained by bonding two or more pre-shaped or pre-molded core members. In the latter case, the core members may be bonded by any one of a method in which the core members are bonded with an adhesive, a method in which the core members are fused by hot plate fusing, vibration fusing or ultrasonic fusing, a method in which the core members are provided with a snap fit on their outer surfaces, a method in which the core members are bonded to each other with a connecting member, and a method in which melt-spun fibers are externally wound around the core members.

Detailed Description Text (31):
The core members 110 were formed by injection molding nylon 6 containing a glass fiber. The two core members 110 were bonded to each other, bonding surface 111 to bonding surface 111, with an adhesive.

Detailed Description Text (72):
The numerical analysis of the temperature distribution and the pressure distribution of the molten resin on the basis of the numerical analysis of flow behavior of the molten resin in the injection step can be carried out by resin flow simulation. As this resin flow simulation, a resin flow simulator of a molten resin based on presently and generally used Hele-Shaw flow can be used. Developments of resin flow simulators in an injection molding method are vigorously under way, and most of

analysis methods therefor are based on an assumption that the flow of a molten resin as a viscous fluid is a Hele-Shaw flow. This flow is analyzed with discretization by a method such as a finite element method. The following equation of motion, equation of continuity and equation of energy are used.

Detailed Description Text (113):
As shown in FIGS. 37A and 37B, the three-dimensional hollow molded article for which the over-molding method is to be optimized in Example 9 is a cylindrical article of which the central portion is formed of a spherical portion having a diameter of about 30 mm. FIGS. 37A and 37B show the three-dimensional hollow molded article viewed from different angles. FIGS. 38A and 38B show a core formed of a resin, and show the core viewed from different angles. The three-dimensional hollow molded article shown in FIGS. 37A and 37B is formed by entirely covering the outer surface of the core shown in FIGS. 38A and 38B. The core has a thickness of 2 mm, and the resin which covers the outer surface of the core is also designed to have a thickness of 2 mm. As a result, the central spherical portion is designed to have a final thickness (wall thickness) of 4 mm. The resin which covers the opening portions of the core is designed to have a thickness of 2.5 mm.

WEST

Generate Collection

L16: Entry 19 of 36 File: JPAB Aug 21, 2001

PUB-NO: JP02001225356A
DOCUMENT-IDENTIFIER: JP 2001225356 A
TITLE: COMPOSITE INJECTION MOLDING METHOD

PUBN-DATE: August 21, 2001

INVENTOR-INFORMATION:
NAME COUNTRY
HARADA, KATSUTOSHI
SHIMIZU, YUKIO

ASSIGNEE-INFORMATION:
NAME COUNTRY
YAZAKI IND CHEM CO LTD

APPL-NO: JP2000367378
APPL-DATE: December 1, 2000

INT-CL (IPC): B29 C 45/16; B29 C 45/26; B29 C 45/33

ABSTRACT:

PROBLEM TO BE SOLVED: To provide a composite injection molding method efficiently capable of injection molding at a low cost by one injection mold.

SOLUTION: A first sprue for a first resin communicating with a frame 1b through a first gate 11 and the second sprue for a second resin communicating with a frame 1e through a second gate are provided on a fixed side and a first slide piece 2 capable of advancing and retreating in a mold opening direction and the direction crossing the mold opening direction at a right angle and a second slide piece 3 capable of advancing and retreating only in the mold opening direction are arranged. A gate piece 23 enabling the second gate 21 to protrude is formed on a movable side 20 and constituted so as to close the second gate 21 at the time of advance of the first slide piece 2 and to communicate with the second gate 21 at the time of advance of the second slide piece 3 and the first resin is injected from the first sprue to primarily inject the base of a main body and the frame 7b lower than the base by one step and the second resin is injected from the second sprue to perform a series of operations up to secondary injection for filling the frame 1e lower than the base of the main body by one step in a mold closed state.

WEST

Generate Collection

L16: Entry 1 of 1 File: USPT Aug 24, 1999

DOCUMENT-IDENTIFIER: US 5942169 A
TITLE: Optimization of overmolding method for three-dimensional hollow molded article

US PATENT NO. (1):
5942169

Detailed Description Text (35):
Then, as shown in the schematic partial cross-sectional view of FIG. 11B, a molten resin 46 was simultaneously injected into the space 44 and the space 45 formed by the core 120 and a cavity wall 43A of the mold through the three resin injection portions 41. The--molten resin was injected in such an amount that the space 44 and the space 45 were completely filled at the time of completion of the injection. The injection conditions were as follows.

WEST

Generate Collection

L16: Entry 2 of 36 File: PGPB Apr 11, 2002

DOCUMENT-IDENTIFIER: US 20020040806 A1
TITLE: Electrical bushings with resin casting

Summary of Invention Paragraph (37):
[0033] Preferably the bushing assembly is cast in a one step mould process.